AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

Listing of Claims:

Claim 1 (Previously Presented): A network system, comprising:

a radio terminal having a first communication interface usable for reception only and a second communication interface usable for transmission and reception;

a first sub-network to which the radio terminal is connected through a radio base station of a downlink radio network by using the first communication interface;

a second sub-network to which the radio terminal is connected through a bidirectional communication network by using the second communication interface, the second sub-network being connected with the first sub-network through a backbone network; and

a packet relay device configured to receive a request message requesting a protocol processing with respect to the first sub-network from the radio terminal through the second sub-network, and carry out the protocol processing on the first sub-network according to the request message on behalf of the radio terminal, such that a response message corresponding to the request message obtained by the protocol processing is returned from the first sub-network to the radio terminal through the downlink radio network or the bidirectional communication network,

wherein the radio terminal is configured to receive a notification message indicating an existence or an address of the packet relay device on the first sub-network through the downlink radio network by using the first communication interface when the radio terminal enters a radio area of the radio base station, and is configured to transmit the request message after receiving the notification message at the first communication interface, and

the radio terminal is further configured to process the response message received by the first or second communication interface.

2

Claim 2 (Previously Presented): The network system of claim 1, wherein the radio

terminal is configured to transmit the request message after receiving the notification

message at the first communication interface, by encapsulating the request message into an IP

(Internet Protocol) packet destined to the address of the packet relay device obtained

according to the notification message and transmitting the IP packet from the second

communication interface;

the packet relay device is configured to decapsulate the IP packet received from the

radio terminal through the second sub-network, carry out the protocol processing on behalf of

the radio terminal according to the request message taken out from the IP packet, and

transmit the response message in a form of such a prescribed packet that is received by the

second communication interface of the radio terminal through the second sub-network; and

the radio terminal is configured to process the response message contained in the

prescribed packet.

Claim 3 (Currently Amended): A packet relay device for use in a network system

containing a radio terminal having a first communication interface usable for reception only

and a second communication interface usable for transmission and reception, a first sub-

network to which the radio terminal is connected through a radio base station of a downlink

radio network by using the first communication interface, and a second sub-network to which

the radio terminal is connected through a bidirectional communication network by using the

second communication interface, the second sub-network being connected with the first sub-

network through a backbone network, the packet relay device comprising:

a communication interface configured to receive an encapsulated IP packet containing

a request message requesting a protocol processing with respect to the first sub-network,

which is transferred from the radio terminal located in a radio area of the radio base station

through the second sub-network; and

a processing unit configured to decapsulate the encapsulated IP packet received by the

communication interface so as to take out the request message, and carry out the protocol

processing on the first sub-network according to the request message on behalf of the radio

terminal,

wherein the communication interface is also configured to transmit a response

message corresponding to the request message obtained by the protocol processing ~~in a form~~

~~such~~ as an encapsulated IP packet to be received by the radio terminal through the second

sub-network.

Claim 4 (Canceled).

Claim 5 (Previously Presented): The packet relay device of claim 3, wherein the

communication interface is configured to transmit the response message by rewriting a

destination address of the response message into an IP (Internet Protocol) address acquired by

the radio terminal at a second sub-network side.

Claim 6 (Previously Presented): The packet relay device of claim 3, wherein the

communication interface is configured to transmit the response message by encapsulating the

response message into an IP (Internet Protocol) packet destined to an IP address acquired by

the radio terminal at a second sub-network side.

Claim 7 (Original): The packet relay device of claim 3, wherein when the request

message is a DHCP (Dynamic Host Configuration Protocol) request message, the processing

unit transmits the DHCP request message to the first sub-network and receives a DHCP

response message from a DHCP server that processed the DHCP request message.

Claim 8 (Previously Presented): A radio terminal for use in a network system

containing a first sub-network to which the radio terminal is connected through a radio base

station of a downlink radio network, a second sub-network to which the radio terminal is

connected through a bidirectional communication network, the second sub-network being

connected with the first sub-network through a backbone network, and a packet relay device

for carrying out a protocol processing on the first sub-network on behalf of the radio terminal,

the radio terminal comprising:

a first communication interface usable for reception only, by which the radio terminal

is connected to the first sub-network, which is configured to receive a notification message

indicating an existence or an address of the packet relay device on the first sub-network

through the downlink radio network when the radio terminal enters a radio area of the radio

base station;

a second communication interface usable for transmission and reception, by which the

radio terminal is connected to the second sub-network, which is configured to transmit a

request message requesting a protocol processing with respect to the first sub-network after

receiving the notification message at the first communication interface, by encapsulating the

request message into an IP (Internet Protocol) packet destined to the address of the packet

relay device obtained according to the notification message and transmitting the IP packet

through the second sub-network; and

a processing unit configured to process a response message corresponding to the

request message obtained by the protocol processing, the response message being returned

from the second sub-network through the bidirectional communication network.

5

Claim 9 (Original): The radio terminal of claim 8, wherein the second communication interface is also configured to receive the response message transmitted from the packet relay device through the second sub-network.

Claim 10 (Original): The radio terminal of claim 8, wherein when the response message is an encapsulated IP packet, the second communication interface decapsulates the encapsulated IP packet so as to take out the response message and gives the response message taken out from the encapsulated IP packet to the processing unit.

Claim 11 (Original): The radio terminal of claim 8, wherein the notification message is provided in a form of a specific message to be regularly transmitted by the radio base station or a specific node provided in the first sub-network, and the first communication interface is configured to acquire information indicating the existence or the address of the packet relay device by receiving the specific message regularly transmitted by the radio base station or the specific node.

Claim 12 (Original): The radio terminal of claim 8, wherein the second communication interface transmits the request message in a form of a broadcast packet with respect to the first sub-network or a multicast packet with respect to a prescribed group of nodes on the first sub-network.

Claim 13 (Original): The radio terminal of claim 8, wherein the second communication interface transmits the request message which is any one of a DHCP (Dynamic Host Configuration Protocol) request message with respect to the first sub-

network, a router solicitation message with respect to the first sub-network, an IGMP

(Internet Group Management Protocol) report message with respect to a multicast router on

the first sub-network, an ARP (Address Resolution Protocol) response message with respect

to the first sub-network, and an SLP (Service Location Protocol) request message with

respect to the first sub-network.

Claim 14 (Previously Presented): The radio terminal of claim 13, wherein when the

request message is the DHCP request message, upon receiving a DHCP response message

corresponding to the DHCP request message, the processing unit sets the second

communication interface as a transmission interface and the first communication interface as

a reception interface with respect to an IP (Internet Protocol) address allocated to the radio

terminal on the first sub-network that is contained in the DHCP response message.

Claim 15 (Previously Presented): A packet processing method in a network system

containing a radio terminal having a first communication interface usable for reception only

and a second communication interface usable for transmission and reception, a first sub-

network to which the radio terminal is connected through a radio base station of a downlink

radio network by using the first communication interface, and a second sub-network to which

the radio terminal is connected through a bidirectional communication network by using the

second communication interface, the second sub-network being connected with the first sub-

network through a backbone network, the packet processing method comprising:

receiving a notification message indicating an existence or an address of a packet

relay device on the first sub-network through the downlink radio network by using the first

communication interface when the radio terminal enters a radio area of the radio base station;

transmitting a request message requesting a protocol processing with respect to the first sub-network from the radio terminal to the packet relay device through the second sub-network;

receiving the request message and carrying out the protocol processing on the first sub-network according to the request message on behalf of the radio terminal at the packet relay device;

returning a response message corresponding to the request message obtained by the protocol processing from the first sub-network to the radio terminal through the downlink radio network or the bidirectional communication network; and

processing the response message received by the second communication interface at the radio terminal.

Claim 16 (Previously Presented): The method of claim 15, wherein

after receiving the notification message at the first communication interface, the request message is encapsulated by the radio terminal into an IP (Internet Protocol) packet destined to the address of the packet relay device obtained according to the notification message and the IP packet is transmitted from the second communication interface;

the IP packet received from the radio terminal through the second sub-network is decapsulated at the packet relay device and the protocol processing is carried out on behalf of the radio terminal according to the request message taken out from the IP packet at the packet relay device;

the response message in a form of such a prescribed packet that is received by the second communication interface of the radio terminal is returned through the second sub-network from the packet relay device to a radio terminal; and

the response message contained in the prescribed packet received by the second

communication interface is processed at the radio terminal.

Claim 17 (Currently Amended): A packet processing method at a packet relay device

in a network system containing a radio terminal having a first communication interface

usable for reception only and a second communication interface usable for transmission and

reception, a first sub-network to which the radio terminal is connected through a radio base

station of a downlink radio network by using the first communication interface, a second sub-

network to which the radio terminal is connected through a bidirectional communication

network by using the second communication interface, and the second sub-network being

connected with the first sub-network through a backbone network, the method comprising:

receiving an encapsulated IP packet containing a request message requesting a

protocol processing with respect to the first sub-network, which is transferred from the radio

terminal located in a radio area of the radio base station through the second sub-network;

decapsulating the encapsulated IP packet received by the receiving step so as to take

out the request message, and carrying out the protocol processing on the first sub-network

according to the request message on behalf of the radio terminal; and

transmitting a response message corresponding to the request message obtained by the

protocol processing ~~in a form such~~ as <u>an encapsulated IP packet to be</u> received by the radio

terminal through the second sub-network.

Claim 18 (Previously Presented): A packet processing method at a radio terminal in a

network system containing a first sub-network to which the radio terminal is connected

through a radio base station of a downlink radio network, a second sub-network to which the

radio terminal is connected through a bidirectional communication network, the second sub-

9

network being connected with the first sub-network through a backbone network, and a

packet relay device for carrying out a protocol processing on the first sub-network on behalf

of the radio terminal, the method comprising:

receiving a notification message indicating an existence or an address of the packet

relay device on the first sub-network through the downlink radio network when the radio

terminal enters a radio area of the radio base station, using a first communication interface

usable for reception only, by which the radio terminal is connected to the first sub-network;

transmitting a request message requesting a protocol processing with respect to the

first sub-network after receiving the notification message at the first communication

interface, by encapsulating the request message into an IP (Internet Protocol) packet destined

to the address of the packet relay device obtained according to the notification message and

transmitting the IP packet through the second sub-network, using a second communication

interface usable for transmission and reception, by which the radio terminal is connected to

the second sub-network; and

processing a response message corresponding to the request message obtained by the

protocol processing, the response message being returned from the second sub-network

through the bidirectional communication network.

Claim 19 (Currently Amended): A computer usable medium having computer

readable program codes embodied therein for causing a computer to function as a packet

relay device in a network system containing a radio terminal having a first communication

interface usable for reception only and a second communication interface usable for

transmission and reception, a first sub-network to which the radio terminal is connected

through a radio base station of a downlink radio network by using the first communication

interface, and a second sub-network to which the radio terminal is connected through a

bidirectional communication network by using the second communication interface, the second sub-network being connected with the first sub-network through a backbone network, the computer readable program codes include:

a first computer readable program code for causing said computer to receive an encapsulated IP packet containing a request message requesting a protocol processing with respect to the first sub-network, which is transferred from the radio terminal located in a radio area of the radio base station through the second sub-network;

a second computer readable program code for causing said computer to decapsulate the encapsulated IP packet received by the first computer readable program code so as to take out the request message, and carry out the protocol processing on the first sub-network according to the request message on behalf of the radio terminal; and

a third computer readable program code for causing said computer to transmit a response message corresponding to the request message obtained by the protocol processing in a form such as an encapsulated IP packet to be received by the radio terminal through the second sub-network.

Claim 20 (Previously Presented): A computer usable medium having computer readable program codes embodied therein for causing a computer to function as a radio terminal in a network system containing a first sub-network to which the radio terminal is connected through a radio base station of a downlink radio network, a second sub-network to which the radio terminal is connected through a bidirectional communication network, the second sub-network being connected with the first sub-network through a backbone network, and a packet relay device for carrying out a protocol processing on the first sub-network on behalf of the radio terminal, the computer readable program codes include:

a first computer readable program code for causing said computer to receive a notification message indicating an existence or an address of the packet relay device on the first sub-network through the downlink radio network when the radio terminal enters a radio area of the radio base station, using a first communication interface usable for reception only, by which the radio terminal is connected to the first sub-network;

a second computer readable program code for causing said computer to transmit a request message requesting a protocol processing with respect to the first sub-network after receiving the notification message at the first communication interface, by encapsulating the request message into an IP (Internet Protocol) packet destined to the address of the packet relay device obtained according to the notification message and transmitting the IP packet through the second sub-network, using a second communication interface usable for transmission and reception, by which the radio terminal is connected to the second sub-network; and

a third computer readable program code for causing said computer to process a response message corresponding to the request message obtained by the protocol processing, the response message being returned from the second sub-network through the bidirectional communication network.